



SEQUENCE LISTING

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Odell, Joan T.

Yu, Xiaodan

<120> Nucleic Acid Fragments Encoding Isoflavone Synthase

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<140> 09/857.581

<141> 2001-05-06

<150> PCT/US00/01,772

<151> 2000-01-26

<150> 60/117,769

<151> 1999-01-27

<150> 60/144,783

<151> 1990-07-20

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<151> 1999-09-24

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<170> PatentIn version 3.3

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His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
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Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
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Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
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Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp

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 35 40 45
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met
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 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
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 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Thr
 85 90 95
 Arg Arg Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro
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 Tyr Trp Arg Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
 115 120 125

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Phe	Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155
Val	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175
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Asp	Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	420	425	430
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 <213> Vicia villosa

<400> 17
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 acgacatctt gaacaagtgc gacctgtctg ttgaaagagt catcaagaag cgccgtgaga 720
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 g 1501

<210> 18
 <211> 499
 <212> PRT
 <213> Vicia villosa

<400> 18
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 His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
 20 25 30
 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
 35 40 45
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met

50	55	60
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln 65 70 75 80		
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile 85 90 95		
Arg Arg Leu Thr Tyr Asp Ser Leu Val Ala Met Val Pro Phe Gly Pro 100 105 110		
Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala 115 120 125		
Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys 130 135 140		
Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp 145 150 155 160		
Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met 165 170 175		
Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu 180 185 190		
Lys Ile Tyr Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys 195 200 205		
His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn 210 215 220		
Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile 225 230 235 240		
Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly 245 250 255		
Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu 260 265 270		
Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe 275 280 285		
Ser Ala Gly Ile Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala 290 295 300		
Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val 305 310 315 320		
Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln 325 330 335		
Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His 340 345 350		
Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile 355 360 365		
Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp 370 375 380		

Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
385 390 395 400

Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu
405 410 415

Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
420 425 430

Gly Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
435 440 445

Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
450 455 460

Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
465 470 475 480

Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
485 490 495

Ala Arg Ile

<210> 19
<211> 1501
<212> DNA
<213> Lens culinaris

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tgctgggccc tcaaggacaa atattgaaag gtgatgatgc caaagttagc atggaagaga 1440
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g 1501

<210> 20
<211> 499
<212> PRT

<213> Lens culinaris

<400> 20

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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
20 25 30
His Pro His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
35 40 45
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
50 55 60
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
65 70 75 80
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
85 90 95
Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
100 105 110
Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
115 120 125
Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
130 135 140
Phe Leu Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp
145 150 155 160
Val Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
165 170 175
Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
180 185 190
Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys
195 200 205
Tyr Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
210 215 220
Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile
225 230 235 240
Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly
245 250 255
Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu
260 265 270
Ile Lys Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe
275 280 285
Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
290 295 300
Glu Leu Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val

305 310 315 320
 Tyr Ser Val Val Gly Lys Asp Ile Leu Val Asp Glu Val Asp Thr Gln
 325 330 335
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
 340 345 350
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly His Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 21
 <211> 1501
 <212> DNA
 <213> Lens culinaris

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 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggctccctta ttctctctct 180
 actttggctc catgccaacc gttgttgctt ccacaccaga attgttcaag ctcttctctc 240
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctacagccata agacgcctca 300
 cctatgatag ctacagtggc atggttccct tcggacctta ctggaagtgc gtgagggaagc 360
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 acgacatctt gaacaagtgc gacctgtctg ttgaaagagt catcaagaag cgccgtgaga 720
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tcttcaatgt atggcaagta ggaagagacc ccaaatactg ggacagacca tcggagttcc	1200
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gacgacattt tcaacttctc ccatttgggt ctgggaggag aatgtgccct ggagtcaatc	1320
tggtactttc gggaatggca acacttcttg catctcttat tcagtgtctt gacttgcagg	1380
tgctgggtcc acaaggacag atattgaagg gtgggtgacgc caaagtttagc atggaagaga	1440
gagccggcct cactgttcca agggcacata gtcttgtctg tgttccactt gcaaggatcg	1500
g	1501

<210> 22
 <211> 499
 <212> PRT
 <213> Lens culinaris

<400> 22

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			20					25					30		
His	Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp
		35					40					45			
Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met
	50					55					60				
Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln
65					70					75					80
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile
				85					90					95	
Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro
			100					105					110		
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala
		115					120					125			
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys
	130					135					140				
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp
145				150					155						160
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met
				165				170						175	
Val	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu
		180					185						190		
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys
		195					200					205			
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn
	210					215					220				
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile
225					230					235				240	

Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly
 245 250 255
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu
 260 265 270
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe
 275 280 285
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
 290 295 300
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val
 305 310 315 320
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln
 325 330 335
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
 340 345 350
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly Cys Val Thr Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu
 405 410 415
 Asp Leu Arg Gly Arg His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 23
 <211> 1566
 <212> DNA
 <213> Phaseolus aureus

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 cgtcttccct tcataggaca cttcatctc ttaaaagaca aacttctcca ctacgcactc 180
 atcgacctct ccaaaaaaca tggctccctta ttctctctct actttggctc catgcccaacc 240


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gttgttgcct ccacaccaga attgttcaag ctcttcctcc aaacgcacga ggcaacttcc 300
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<210> 24

<211> 522

<212> PRT

<213> Phaseolus aureus

<400> 24

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
35 40 45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
50 55 60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
65 70 75 80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
85 90 95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
100 105 110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
115 120 125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
130 135 140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
145 150 155 160

Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr

165										170					175						
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu						
			180					185					190								
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile						
		195					200					205									
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu						
	210					215					220										
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe						
225					230				235						240						
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg						
				245					250					255							
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe						
			260					265					270								
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys						
		275					280					285									
Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala						
	290					295					300										
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu						
305					310					315					320						
Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Ala	Tyr	Ser						
				325					330					335							
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu						
			340					345					350								
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro						
		355					360					365									
Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly						
	370					375					380										
Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	Gln	Val						
385					390					395					400						
Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	Pro	Glu						
				405					410					415							
Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp	Leu						
			420					425					430								
Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg	Met						
		435					440					445									
Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	Leu	Ala						
	450					455					460										
Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly	Gln						
465					470					475					480						
Ile	Leu	Lys	Gly	Gly	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	Ala	Gly						
				485					490					495							

Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510

Ile Gly Val Ala Ser Lys Leu Leu Ser Lys
 515 520

<210> 25
 <211> 1566
 <212> DNA
 <213> Phaseolus aureus

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 cgtcttccct tcataggaca ccttcatctc ttaaaagaca aacttctcca ctacgcgtc 180
 atcgacctct ccaaaaaaca tgggtccctta ttctctctct actttggctc catgccaacc 240
 gttgttgctt ccacaccaga attgttcaag ctcttcctcc aaacgcacga ggcaacttcc 300
 ttcaacacaa ggttccaaac ctcagccata agacgcctca cctatgatag ctcagtggcc 360
 atggttccct tcggacctta ctggaagttc gtgaggaagc tcatcatgaa cgaccttctc 420
 aacgccacca ctgtaaacia gttgaggcct ttgaggaccc aacagatccg caagttcctt 480
 agggctatgg cccaaggcgc agaggcacag aagccccttg acttgaccga ggagcttctg 540
 aaatggacca acagcaccat ctccatgatg atgctcggcg aggctgagga gatcagagac 600
 atcgctcgcg aggttcttaa gatctttggc gaatacagcc tcaactgactt catctggcca 660
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 gacctgtctg ttgaaagagt catcaagaag cgccgtgaga tcgtgaggag gagaaagaac 780
 ggagagggtt ttgagggtga ggtcagcggg gttttccttg acactttgct tgaattcgct 840
 gaggatgaga ccatgggat caaaatcacc aaggaccaca tcaagggtct tgttgtcgac 900
 tttttctcgg caggaacaga ctccacagcg gtggcaacag agtgggcatt ggcagaactc 960
 atcaacaatc ctaagggtgtt ggaaaaggct cgtgaggagg tctacagtgt tgtgggaaag 1020
 gacagacttg tggacgaagt tgacactcaa aaccttcctt acattagagc aatcgtgaag 1080
 gagacattcc gcatgcacc gccactccca gtggtcaaaa gaaagtgcac ggaagagtgt 1140
 gagattaatg gatattgtgat cccagaggga gcattgattc tcttcaatgt atggcaagta 1200
 ggaagagacc ccaaatactg ggacagacca tcggagttcc gtcctgagag gttcctagag 1260
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 ccatttgggt ctgggaggag aatgtgccct ggagtcaatc tggctacttc gggaatggca 1380
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 atattgaagg gtggtgacgc caaagttagc atggaagaga gagccggcct cactgttcca 1500
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 tcttaa 1566

<210> 26
 <211> 521
 <212> PRT
 <213> Phaseolus aureus

<400> 26
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 His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu
 20 25 30
 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
 35 40 45
 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
 50 55 60
 Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
 65 70 75 80

Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His		
				85					90					95			
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg		
			100					105					110				
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp		
		115					120					125					
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr		
	130					135					140						
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu		
145					150					155					160		
Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr		
				165					170					175			
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu		
			180					185					190				
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile		
		195					200					205					
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu		
	210					215					220						
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe		
225					230					235					240		
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg		
				245					250					255			
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe		
			260					265					270				
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys		
		275					280					285					
Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala		
	290					295					300						
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu		
305					310					315					320		
Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	Tyr	Ser		
				325					330					335			
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu		
			340					345					350				
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro		
		355					360					365					
Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly		
	370					375					380						
Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	Gln	Val		
385					390					395					400		

Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510
 Ile Gly Val Ala Ser Lys Leu Leu Ser
 515 520

<210> 27
 <211> 1566
 <212> DNA
 <213> Phaseolus aureus

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 cgtcttccct tcataggaca ccttcattctc ttaaaagaca aacttctcca ctacgcactc 180
 atcgacctct ccaaaaaaca tgggtccctta ttctctctct actttggctc catgccaaac 240
 gttgttgccct ccacaccaga attgttcaag ctcttctctc aaacgcacga ggcaacttcc 300
 ttcaacacaa ggttccaaac ctcagccata agacgcctca cctatgatag ctcatgtggc 360
 atggttccct tcggacctta ctggaagttc gtgaggaagc tcatcatgaa cgaccttctc 420
 aacgccacca ctgtaaaciaa gttgaggcct ttgaggaccc aacagatccg caagttcctt 480
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 atcgctcgcg aggttcttaa gatctttggc gaatacagcc tcaactgactt catctggcca 660
 ttgaagcatc tcaagggttg aaagtatgag aagaggatcg acgacatctt gaacaagttc 720
 gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga tcgtgaggag gagaaagaac 780
 ggagagggtg ttgagggtga ggtcagcggg gttttccttg acactttgct tgaattcgct 840
 gaggatgaga ccacgggat caaaatcacc aaggaccaca tcaaggggtct tgttgctcgac 900
 tttttctcgg caggaacaga ctccacagcg gtggcaacag agtgggcatt ggcagaactc 960
 atcaacaatc ctaagggtgt ggaaaaggct cgtgaggagg tctacagtgt tgtgggaaag 1020
 gacagacttg tggacgaagt tgacactcaa aaccttcctt acattagagc aatcgtgaag 1080
 gagacattcc gcatgcacc gccactccca gtggtcaaaa gaaagtgcac agaagagtgt 1140
 gagattaatg gatattgtgat cccagaggga gcattgattc tcttcaatgt atggcaagta 1200
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 ccatttggtg ctgggaggag aatgtgccct ggagtcgaatc tggctacttc gggaatggca 1380
 acacttcttg catctcttat tcagtgcctt gacttgcaag tgctgggtcc acaaggacag 1440
 atattgaagg gtggtgacgc caaagttagc atggaagaga gggccggcct cactgttcca 1500
 agggcacata gtcttgtctg tgttccactt gcaaggatcg gcgttgcatc taaactcctt 1560
 tcttaa 1566

<210> 28
 <211> 521
 <212> PRT

<213> Phaseolus aureus

<400> 28

Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu
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His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu
20 25 30
Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
35 40 45
His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
50 55 60
Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
65 70 75 80
Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
85 90 95
Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
100 105 110
Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
115 120 125
Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
130 135 140
Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
145 150 155 160
Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr
165 170 175
Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
180 185 190
Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
195 200 205
Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu
210 215 220
Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
225 230 235 240
Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg
245 250 255
Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe
260 265 270
Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys
275 280 285
Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala
290 295 300
Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu

305 310 315 320
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510
 Ile Gly Val Ala Ser Lys Leu Leu Ser
 515 520

<210> 29
 <211> 1566
 <212> DNA
 <213> Phaseolus aureus

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 atcgacctct ccaaaaaaca tgggccctta ttctctctct actttggctc catgccaaacc 240
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 ttcaacacaa ggttccaaac ctcagccata agacgcctca cctatgatag ctcagtggcc 360
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 aacgccacca ctgtaaaca gttgaggcct ttgaggaccc aacagatccg caagtccctt 480
 agggttatgg cccaaggcgc agaggcacag aagccccttg acttgaccga ggagcttctg 540
 aaatggacca acagcaccat ctccatgatg atgctcggcg aggctgagga gatcagagac 600
 atcgctcgcg aggttcttaa gatctttggc gaatacagcc tctactgactt catctggcca 660
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 gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga tcgtgaggag gagaaagaac 780
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atcaacaatc	ctaaggtgtt	ggaaaaggct	cgtgaggagg	tctacagtgt	tgtgggaaag	1020
gacagacttg	tggacgaagt	tgacactcaa	aaccttcctt	acattagagc	aatcgtgaag	1080
gagacattcc	gcatgcaccc	gccactccca	gtgggtcaaaa	gaaagtgcac	agaagagtgt	1140
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atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	gagccggcct	cactgttcca	1500
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tcttaa						1566

<210> 30
 <211> 521
 <212> PRT
 <213> Phaseolus aureus

<400> 30
 Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu
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 20 25 30
 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
 35 40 45
 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
 50 55 60
 Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
 65 70 75 80
 Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
 85 90 95
 Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
 100 105 110
 Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
 115 120 125
 Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
 130 135 140
 Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
 145 150 155 160
 Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr
 165 170 175
 Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
 180 185 190
 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
 195 200 205
 Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu
 210 215 220

Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
 225 230 235 240
 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg
 245 250 255
 Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe
 260 265 270
 Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile Lys
 275 280 285
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala
 290 295 300
 Gly Thr Asp Ser Thr Ala Glu Ala Thr Glu Trp Ala Leu Ala Glu Leu
 305 310 315 320
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510
 Ile Gly Val Ala Ser Lys Leu Leu Ser
 515 520
 <210> 31
 <211> 1566
 <212> DNA

<213> Trifolium pratense

<400> 31

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cgtcttccct	tcataggaca	ccttcacttc	ttaaaagaca	aacttctcca	ctacgcactc	180
atcgacctct	ccaaaaaaca	tggtccttta	ttctctctct	actttggctc	catgcccaacc	240
gttggttgct	ccacaccaga	attgttcaag	ctcttcctcc	aaacgcacga	ggcaacttcc	300
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<210> 32

<211> 521

<212> PRT

<213> Trifolium pratense

<400> 32

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			20					25					30		
Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Leu
			35				40					45			
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser
			50			55					60				
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr
65					70					75					80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His
				85					90					95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg
			100					105					110		
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Ile	Gly	Pro	Tyr	Trp
			115				120					125			

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
 130 135 140
 Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
 145 150 155 160
 Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr
 165 170 175
 Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
 180 185 190
 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
 195 200 205
 Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu
 210 215 220
 Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
 225 230 235 240
 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg
 245 250 255
 Arg Arg Lys Asn Gly Glu Val Asp Glu Gly Glu Val Ser Gly Val Phe
 260 265 270
 Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys
 275 280 285
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala
 290 295 300
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu
 305 310 315 320
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala

450 455 460

Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480

Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495

Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510

Ile Gly Val Ala Ser Lys Leu Leu Ser
 515 520

<210> 33
 <211> 1566
 <212> DNA
 <213> Trifolium pratense

<400> 33

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acacccactg	caaaatcaaa	agcacttcgc	catctcccaa	acccaccaag	cccaaagcct	120
cgtcttccct	tcataggaca	ccttcatctc	ttaaaagaca	aacttctcca	ctacgcactc	180
atcgacctct	ccaaaaaaca	tggtccctta	ttctctctct	actttggctc	catgccaaacc	240
gttggtgcct	ccacaccaga	attgttcaag	ctcttccctc	aaacgcacga	ggcaacttcc	300
ttcaacacaa	ggttccaaac	ctcagccata	agacgcctca	cctatgatag	ctcagtggcc	360
atggttccct	tccgacctta	ctggaagttc	gtgaggaagc	tcatcatgaa	cgaccttctc	420
aacgccacca	ctgtaaacaa	gttgaggcct	ttgaggaccc	aacagatccg	caagttcctt	480
aggggttatg	cccaaggcgc	agaggcacag	aagccccttg	acttgaccga	ggagcttctg	540
aaatggacca	acagcaccat	ctccatgatg	atgctcggcg	aggctgagga	gatcagagac	600
atcgctcgcg	aggttcttaa	gatctttggc	gaatacagcc	tactgacttt	catctggcca	660
ttgaagcatc	tcaaggttgg	aaagtatgag	aagaggatcg	acgacatctt	gaacaagttc	720
gaccctgtcg	ttgaaagagt	catcaagaag	cgccgtgaga	tcgtgaggag	gagaaagaac	780
ggagagggtg	ttgagggtga	ggtcagcggg	gttttccttg	acactttgct	tgaattcgct	840
gaggatgaga	ccacggagat	caaaatcacc	aaggaccaca	tcaagggtct	tgttgtcgac	900
tttttctcgg	caggaacaga	ctccacagcg	gtggcaacag	agtgggcatt	ggcagaactc	960
atcaacaatc	ctaaggtggt	ggaaaaggct	cgtgaggagg	tctacagtgt	tgtgggaaaag	1020
gacagacttg	tggaacgaag	tgacactcaa	aaccttcctt	acattagagc	aatcgtgaag	1080
gagacattcc	gcatgcaccc	gccactccca	gtggtcaaaa	gaaagtgcac	agaagagtgt	1140
gagattaatg	gatatgtgat	cccagaggga	gcattgattc	tcttcaatgt	atggcaagta	1200
ggaagagacc	ccaaatactg	ggacagacca	tcggagtctc	gtcctgagag	gttcctagag	1260
acaggggctg	aaggggaagc	aaggcctctt	gatcttaggg	gacaacattt	tcaacttctc	1320
ccatttgggt	ctgggaggag	aatgtgccct	ggagtcaatc	tggtacttct	gggaatggca	1380
acacttcttg	catctcttat	tcagtgtctt	gacttgcaag	tgctgggtcc	acaaggacag	1440
atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	gggccggcct	cactgttcca	1500
agggcacata	gtcttgtctg	tgttccactt	gcaaggatcg	gcgttgcatc	taaactcctt	1560
tcttaa						1566

<210> 34
 <211> 521
 <212> PRT
 <213> Trifolium pratense

<400> 34

Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu
 1 5 10 15

His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu
 20 25 30

Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu

35					40					45					
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser
50						55					60				
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr
65					70					75					80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His
				85					90					95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg
			100					105					110		
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp
		115					120					125			
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr
	130					135					140				
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu
145					150					155					160
Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr
				165					170					175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu
			180					185					190		
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile
		195					200					205			
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu
	210					215					220				
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe
225					230					235					240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg
				245					250					255	
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe
			260					265					270		
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu	Ile	Lys
		275					280					285			
Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala
	290					295					300				
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu
305					310					315					320
Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	Tyr	Ser
				325					330					335	
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu
			340					345					350		
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro
		355					360					365			

Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510
 Ile Gly Val Ala Ser Lys Leu Leu Ser
 515 520

<210> 35
 <211> 1563
 <212> DNA
 <213> Pisum sativum

<400> 35
 atgttgctgg aacttgcaact tggtttgttt gtgtagctt tgtttctgca cttgcgtccc 60
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 cgtcttcctt tcattggcca ccttcacctc ttaaaagata aacttctcca ctatgcactc 180
 atcgatctct ccaaaaagca tggcccctta ttctctctct ccttcggctc catgccaaac 240
 gtcgttgccct ccacccctga gttgttcaag ctcttcctcc aagcccacga ggcaacttcc 300
 ttcagcacaa ggttccaaac ctctgccgta agacgcctca cttacgacaa ctctgtggcc 360
 atggttccat tcggacctta ctggaagtgc gtgaggaagc tcatcatgaa cgaccttctc 420
 aacgccacca ccgtcaacga gctcaggcct ttgaggaccc aacagatccg caagttcctt 480
 agggttatgg cccaaagcgc agaggcccag aagccccttg acgtcaccga ggagcttctc 540
 aaatggacca acagcaccat ctccatgatg atgctcggcg aggetgagga gatcagagac 600
 atcgtctcgc aggtccttaa gatcttcggc gaatacagcc tcaactgactt catctggcct 660
 ttgaagatc tcaaggttgg aaagtatgag aagaggattg atgacatctt gaacaagttc 720
 gaccctgtcg ttgaaaggtt catcaagaag cgccgtgaga tcgtcagaag gagaaagaac 780
 ggagaagttg ttgagggcga ggccagcggc gtcttcctcg acactttgct tgaattcgct 840
 gaggacgaga ccatggagat caaaattacc aaggagcaaa tcaagggcct tgttgtcgac 900
 tttttctctg cagggacaga ttccacagcg gtggcaacag agtgggcatt ggcagagctc 960
 atcaacaatc ccagggtgtt gcaaaaggct cgtgaggagg tctacagtgt tgtgggcaaa 1020
 gatagactcg ttgacgaagt cgacactcaa aaccttcctt acattagggc cattgtgaag 1080
 gagacattcc gaatgcaccc accactccca gtggtcaaaa gaaagtgcac agaagagtgt 1140
 gagattaatg ggtatgtgat ccagagggga gcattggttc ttttcaatgt ttggcaagta 1200
 gaaaggacc caaataactg ggacagacca tcagaattcc gtcccagagag gttcttagaa 1260
 actggcgctg aaggggaagc agggcctctt gatcttaggg gccagcattt ccaactcctc 1320
 ccatttgggt ctgggaggag aatgtgccct ggtgtcaatt tggctacttc aggaatggca 1380
 acacttcttg catctcttat ccaatgcttt gacctgcaag tgctgggccc tcaaggacaa 1440

atattgaaag gtgacgatgc caaagtttagc atggaagaga gagctggcct caccgttcca 1500
 agggcacata gtctcgtttg tgttcactt gcaaggatcg gcgttgcac taaactcctt 1560
 tct 1563

<210> 36
 <211> 521
 <212> PRT
 <213> Pisum sativum

<400> 36
 Met Leu Leu Glu Leu Ala Leu Gly Leu Phe Val Leu Ala Leu Phe Leu
 1 5 10 15
 His Leu Arg Pro Thr Pro Ser Ala Lys Ser Lys Ala Leu Arg His Leu
 20 25 30
 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
 35 40 45
 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
 50 55 60
 Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met Pro Thr
 65 70 75 80
 Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Ala His
 85 90 95
 Glu Ala Thr Ser Phe Ser Thr Arg Phe Gln Thr Ser Ala Val Arg Arg
 100 105 110
 Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
 115 120 125
 Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
 130 135 140
 Val Asn Glu Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
 145 150 155 160
 Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp Val Thr
 165 170 175
 Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
 180 185 190
 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
 195 200 205
 Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys Tyr Leu
 210 215 220
 Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
 225 230 235 240
 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg
 245 250 255
 Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly Val Phe
 260 265 270

Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile Lys
 275 280 285
 Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala
 290 295 300
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu
 305 310 315 320
 Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Lys Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
 500 505 510
 Ile Gly Val Ala Ser Lys Leu Leu Ser
 515 520

<210> 37
 <211> 1496
 <212> DNA
 <213> Trifolium repens

<400> 37
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 ctccactatg caccatcgat tctctccaaa aagcatggcc ccttattctc tctctccttc 180
 ggctccatgc caaccgtcgt tgccctccacc cctgagttgt tcaagctctt cctccaaacc 240
 cagcaggcaa cttccttcaa cacaaggctc caaacctctg ccataagaca cctcacttac 300
 gacaactctg tggccatggt tccattcgga ccttactgga agttcgtgag gaagctcatc 360
 atgaacgacc ttctcaacgc caccaccgtc aacaagctca ggcctttgag gacccaacag 420

atccgcaagt	tccttaggg	tatggcccaa	agcgcagagg	cccagaagcc	ccttgacgtc	480
accgaggagc	ttctcaaagt	gaccaacagc	accatctcca	tgatgatgct	cggcgaggct	540
gaggagatca	gagacatcgc	tcgcgaggtt	cttaagatct	tcggcgaata	cagcctcact	600
gacttcatct	ggcctttgaa	gtacctcaag	gttggaaggt	atgagaagag	gattgatgac	660
atccttgaaca	agttcgaccc	tgctggtgaa	agggtcacat	agaagcgccg	tgagatcgtc	720
agaaggagaa	agaacggaga	agttgttgag	ggcgaggcca	gcggcgtctt	cctcgacact	780
ttgcttgaat	tcgctgagga	cgagaccatg	gagatcaaaa	ttaccaagga	gcaaatacaag	840
ggccttggtg	tcgacttttt	ctctgcaggg	acagattcca	cagcgggtgt	aacagagtgg	900
gcattggcag	agctcatcaa	caatcccagg	gtgttgcaaa	aggctcgtga	ggaggtctac	960
agtgttggtg	gcaaagatag	actcgttgac	gaagttgaca	ctcaaaacct	tccttacatt	1020
agggccattg	tgaaggagac	attccgaatg	cacccaccac	tcccagtggt	caaaagaaaag	1080
tgcacagaag	agtgtgagat	taatgggtat	gtgatccag	agggagcatt	ggttcttttc	1140
aatgtttggc	aagtaggaag	ggaccccaaa	tactgggaca	gaccatcaga	atcccgtccc	1200
gagaggttct	tagaaactgg	tgctgaagg	gaagcagggc	ctcttgatct	taggggccag	1260
catttccaac	tcctcccatt	tgggtctggg	aggagaatgt	gccctggtgt	cagtttggtc	1320
acttcaggaa	tggcaacact	tcttgcatct	cttatccaat	gctttgacct	gcaagtgtctg	1380
ggccctcaag	gacaaatatt	gaaaggtgat	gatgccaaaag	ttagcatgga	agagagagct	1440
ggcctcacag	ttccaagggc	acatagtctc	gtttgtgttc	cacttgcaag	gatcgg	1496

<210> 38

<211> 498

<212> PRT

<213> *Trifolium repens*

<400> 38

Ser	His	Leu	Arg	Pro	Thr	Pro	Ser	Ala	Ile	Ser	Lys	Ala	Leu	Arg	His
1				5					10					15	

Leu	Pro	Asn	Pro	Pro	Ser	Pro	Arg	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His
			20					25					30		

Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Pro	Ile	Asp	Leu
		35					40					45			

Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Ser	Phe	Gly	Ser	Met	Pro
	50					55					60				

Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr
65					70					75					80

His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg
				85					90					95	

His	Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr
		100						105					110		

Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr
		115					120					125			

Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe
	130					135					140				

Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Val
145					150					155					160

Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met
			165					170						175	

Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys
			180					185					190		

Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys Tyr
 195 200 205
 Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys
 210 215 220
 Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val
 225 230 235 240
 Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly Val
 245 250 255
 Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile
 260 265 270
 Lys Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe Ser
 275 280 285
 Ala Gly Thr Asp Ser Thr Ala Val Val Thr Glu Trp Ala Leu Ala Glu
 290 295 300
 Leu Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val Tyr
 305 310 315 320
 Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn
 325 330 335
 Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro
 340 345 350
 Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn
 355 360 365
 Gly Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln
 370 375 380
 Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Ser Arg Pro
 385 390 395 400
 Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp
 405 410 415
 Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg
 420 425 430
 Met Cys Pro Gly Val Ser Leu Ala Thr Ser Gly Met Ala Thr Leu Leu
 435 440 445
 Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly
 450 455 460
 Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala
 465 470 475 480
 Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala
 485 490 495
 Arg Ile

<210> 39

<211> 1501
 <212> DNA
 <213> Trifolium repens

<400> 39
 tgttttctgca cttgcgtccc acaccactg caaaatcaaa agcacttcgc catctcccaa 60
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 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tgggccctta ttctctctct 180
 actttggctc catgccaacc gttgttgctt ccacaccaga attgttcaag ctcttccctc 240
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctcagccata agacgcctca 300
 cctacgacaa ctctgtggcc atggttccat tccggacctta ctggaagtgc gtgaggaagc 360
 tcatcatgaa cgaccttctc aacgccacca ccgtcaacaa gctcaggcct ttgaggacct 420
 aacagatccg caagttcctt aggggttatgg cccaaagcgc agaggcccag aagccccttg 480
 acgtcaccga ggagcttctc aaatggacca acagcaccat ctccatgatg atgctcggcg 540
 aggtctgagga gatcagagac atcgctcgcg aggttcttaa gatcttcggc gaatacagcc 600
 tcaactgactt catctggcct ttgaagtatc tcaaggttgg aaagtatgag aagaggattg 660
 atgacatctt gaacaagttc gacctgtctg ttgaaagagt catcaagaag cgccgtgaga 720
 tcgtcagaag gagaaagaac ggagaagttg ttgagggcga ggccagcggc gtcttccctc 780
 acactttgct tgaattcgct gaggacgaga ccatggagat caaaattacc aaggagcaaa 840
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 agtgggcatt ggcagagctc atcaacaatc ccaaggtgtt gcaaaaggct cgtgaggagg 960
 cctacagtgt tgtgggcaaa gatagactcg ttgacgaagt tgacactcaa aaccttccct 1020
 acattagggc cattgtgaag gagacattcc gaatgcaccc accactccca gtgggtcaaaa 1080
 gaaagtgcac agaagagtgt gggattaatg ggtatgtgat cccagagga gcaattggtc 1140
 ttttcaatgt ttggcaagta ggaagggacc ccaaatactg ggacagacca tcagaattcc 1200
 gtcccagagag gttcttagaa actgggtgctg aaggggaagc agggcctctt gatcttaggg 1260
 gccagcattt ccaactcctc ccatttgggt ctgggaggag aatgtgccct ggtgtcaatt 1320
 tggctacttc aggaatggca acacttcttg catctcttat ccaatgcttt gacctgcaag 1380
 tgctgggccc tcaaggacaa atattgaaag gtgatgatgc caaagttagc atggaagaga 1440
 gagctggcct cacagttcca agggcacata gtctcgtttg tgttccactt gcaaggatcg 1500
 g 1501

<210> 40
 <211> 499
 <212> PRT
 <213> Trifolium repens

<400> 40
 Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg
 1 5 10 15
 His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
 20 25 30
 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
 35 40 45
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
 50 55 60
 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
 65 70 75 80
 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
 85 90 95
 Arg Arg Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro
 100 105 110
 Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
 115 120 125

Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	130	135	140
Phe	Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155
Val	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	180	185	190
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	195	200	205
Tyr	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215	220
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	225	230	235
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	245	250	255
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	260	265	270
Ile	Lys	Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	275	280	285
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Gln	Lys	Ala	Arg	Glu	Glu	Ala	305	310	315
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	325	330	335
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	340	345	350
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Gly	Ile	355	360	365
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Val	Leu	Phe	Asn	Val	Trp	370	375	380
Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	385	390	395
Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Gly	Pro	Leu	405	410	415
Asp	Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	420	425	430
Arg	Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	435	440	445

Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460

Gly Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480

Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 41
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 41
 ttgctggaac ttgcacttgg t 21

<210> 42
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 42
 gtatatgatg ggtaccttaa ttaagaaagg ag 32

<210> 43
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 43
 gacgcctcac ttacgacaac tctgtg 26

<210> 44
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 44
 cctctcggga cggaattctg atggt 25

<210> 45
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 45
 gcggtgcacg ggcgactct tcttc 25

<210> 46
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 46
 cgcccaatac gcaaaccgcc tctcc 25

<210> 47
 <211> 1501
 <212> DNA
 <213> Beta vulgaris

<400> 47
 tgtttctgca cttgcgtccc acacccactg caaaatcaaa agcacttcgc catctcccaa 60
 acccaccaag cccaaagcct cgttttccct tcataggaca ccttcactctc ttaaaagaca 120
 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggtcctta ttctctctct 180
 actttggctc catgccaacc gttgttgcc cccaccaga attgttcaag ctcttcctcc 240
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctgagccata agacgcctca 300
 cctatgatag ctgagtgccc atggttccct tcggacctta ctggaagttc gtgaggaagc 360
 tcatcatgaa cgaccttctc aacgccacca ctgtaaaca gttgaggcct ttgaggacct 420
 aacagatccg caagttcctt agggttatgg cccaaggcgc agaggcacag aagccccttg 480
 acttgaccga ggagcttctg aaatggacca acagcaccat ctccatgatg atgctcggcg 540
 aggtgagga gatcagagac atcgctcgcg aggttcttaa gatctttggc gaatacagcc 600
 tctactgactt catctggcca ttgaagcatc tcaaggttg aaagtatgag aagaggatcg 660
 acgacatctt gaacaagttc gacctgtcg ttgaaagagt catcaagaag cgccgtgaga 720
 tcgtgaggag gagaaagaac ggagaggatg ttgaggggta ggtcagcggg gttttccttg 780
 acactttgct tgaattcgct gaggatgaga ccatggagat caaatcacc aaggaccaca 840
 tcaagggctt tgttgtcgac tttttctcgg caggaacaga ctccacagcg gtggcaacag 900
 agtgggcatt ggcagaactc atcaacaatc ctaaggtgtt ggaaaaggct cgtgaggagg 960
 tctacagtgt tgtgggaaag gacagacttg tggacgaagt agacactcaa aaccttcctt 1020
 acattagagc aatcgtgaag gagacattcc gcatgcaccc gccactccca gtggtcaaaa 1080
 gaaagtgcac agaagagtgt gagattaatg gatattgat cccagaggga gcattgattc 1140
 tcttcaatgt atggcaagta ggaagagacc ctaaatactg ggacagacca tcggagttcc 1200
 gtcctgagag gttcctagag acaggggctg aaggggaagc aaggcttctt gatcttaggg 1260
 gacaacattt tcaacttctc ccatttggtg ctgggaggag aatgtgccct ggagtcaatc 1320
 tggctacttc gggaatggca acacttcttg catctcttat tcagtgtttt gacttgcaag 1380
 tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440
 gagccggcct cactgttcca agggcacata gtcttgctctg tgttccactt gcaaggatcg 1500
 g 1501

<210> 48
 <211> 499
 <212> PRT
 <213> Beta vulgaris

<400> 48
 Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg
 1 5 10 15
 His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
 20 25 30

His	Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	35	40	45
Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	50	55	60
Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	65	70	75
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	85	90	95
Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	100	105	110
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	115	120	125
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	130	135	140
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	180	185	190
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	195	200	205
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215	220
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	225	230	235
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Asp	Val	Glu	Gly	Glu	Val	Ser	Gly	245	250	255
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	260	265	270
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	275	280	285
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	305	310	315
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	325	330	335
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	340	345	350

Pro Pro Leu Pro Val Val Lys Arg Lys Cys Ile Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Leu Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 49
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 49
 gaattcgcg cgcgtctaga actagtggat

30

<210> 50
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 50
 gaattcgcg cgcgaattg ggtaccgggc

30

<210> 51
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 51

gcaaacgaag acaaattggga gatgata

27

<210> 52
<211> 1801
<212> DNA
<213> Glycine max

<220>
<221> Intron
<222> (895)..(1112)

<400> 52
ttgctggaac ttgcacttgg tttgtttgtg ttagctttgt ttctgcactt gcgtcccaca 60
ccaagtgcaa aatcaaaaagc acttcgccac ctcccaaacc ctccaagccc aaagcctcgt 120
cttcccttca ttggccacct tcacctctta aaagataaac ttctccacta tgcactcatc 180
gatctctcca aaaagcatgg ccccttattc tctctctcct tcggctccat gccaacgctc 240
gttgcttcca cccctgagtt gttcaagctc ttcttccaaa cccacgaggc aacttccttc 300
aacacaaggt tccaaacctc tgccataaga cgcctcactt acgacaactc tgtggccatg 360
gttccattcg gaccttactg gaagttcgtg aggaaactca tcatgaacga ccttctcaac 420
gccaccaccg tcaacaagct caggcctttg aggacccaac agatccgcaa gttccttagg 480
gttatggccc aaagcgagcagg gccccagaag ccccttgacg tcaccgagga gcttctcaaa 540
tggaaccaaca gcaccatctc catgatgatg ctcggcgagg ctgaggagat cagagacatc 600
gtctcgagagg ttcttaagat cttcggcgaa tacagcctca ctgacttcat ctggcctttg 660
aagtatctca aggttggaag gtatgagaag aggattgatg acatcttgaa caagttcgac 720
cctgtcgttg aaagggctcat caagaagcgc cgtgagatcg tcagaaggag aaagaacgga 780
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gctttgacct gcaagtgtcg ggccctcaag gacaaatatt gaaaggtgat gatgccaaag 1680
ttagcatgga agagagagct ggccctcacag ttccaagggc acatagtctc gtttgtgttc 1740
cacttgcaag gatcggcggt gcactctaac tcctttctta attaagggat ccatcatata 1800
c 1801

<210> 53
<211> 1900
<212> DNA
<213> Glycine max

<220>
<221> Intron
<222> (947)..(1082)

<400> 53
aattagcctc acaaaagcaa agatcaaaca aaccaaggac gagaacacga tgttgcttga 60
acttgcaactt ggtttatttg ttttggtctc gtttctgcac ttgcgtccca caccactgc 120
aaaatcaaaa gcacttcgcc atctcccaaa cccaccaagc ccaaagcctc gtcttccctt 180
cataggacac cttcatctct taaaagacaa acttctccac tacgcaactc tcgacctctc 240
caaaaaacat ggtcccttat tctctctcta ctttggtctc atgccaaccg ttgttgcttc 300
cacaccagaa ttgttcaagc tcttctctca aacgcacgag gcaacttctc tcaacacaag 360
gttccaaacc tcagccataa gacgcctcac ctatgatagc tcagtggcca tggttccctt 420

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tgtaaacaag	ttgaggcctt	tgaggaccca	acagaccgcg	aagttcctta	gggttatggc	540
ccaaggcgca	gaggcacaga	agccccctga	cttgaccgag	gagcttctga	aatggacca	600
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ggttcttaag	atctttggcg	aatacagcct	cactgacttc	atctggccat	tgaagcatct	720
caagggttga	aagtatgaga	agaggatcga	cgacatcttg	aacaagttcg	accctgtcgt	780
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catggagatc	aaaatcacca	aggaccacat	cgagggtcct	gttgctcgtg	gtttcctgct	960
tcattcattg	atcgaaatat	gcagtatttt	gttaacaaga	gatcgagaat	tgacatttat	1020
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tgaaggagac	attccgcgat	caccgcgcac	tcccagtggt	caaaagaaag	tgacagaag	1320
agtgtgagat	taatggatat	gtgatcccag	agggagcatt	gattctcttc	aatgtatggc	1380
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tggcaacact	tcttgcatct	cttattcagt	gcttcgactt	gcaagtgtct	ggtccacaag	1620
gacagatatt	gaagggtggt	gacgccaaa	ttagcatgga	agagagagcc	ggcctcactg	1680
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tcctttctta	attaagatca	tcgtcatcat	catcatatat	aataattact	ttttgtgtgt	1800
tgataatcat	catttcaata	aggtctcggt	catctacttt	ttatgaagta	tataagccct	1860
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<210> 54
 <211> 1501
 <212> DNA
 <213> *Lupinus albus*

<400> 54						
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accaccaag	cccaaagcct	cgtcttccct	tcataggaca	ccttcatctc	ttaaaagaca	120
aacttctcca	ctacgcactc	atcgacctct	ccaaaaaaca	tggtccctta	ttctctctct	180
actttggctc	catgccaacc	gttggtgcct	ccacaccaga	attgttcaag	ctcttcctcc	240
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tcatcatgaa	cgaccttctt	aacgccacca	ctgtaaacaa	gttgaggcct	ttgaggacct	420
aacagatccg	caagttcctt	agggttatgg	cccaaggcgc	agaggcacag	aagccccttg	480
acttgaccga	ggagcttctg	aaatggacca	acagcaccat	ctccatgatg	atgctcggcg	540
aggctgagga	gatcagagac	atcgctcgcg	aggttcttaa	gatctttggc	gaatacagcc	600
tactgactt	catctggcca	ttgaagcatc	tcaaggttgg	aaagtatgag	aagaggatcg	660
acgacatctt	gaacaagttc	gaccctgtcg	ttgaaagagt	catcaagaag	cgccgtgaga	720
tcgtgaggag	gagaaagaac	ggagagggtg	ttgagggtga	ggtcagcggg	gttctccttg	780
acactttgct	tgaattcgct	gaggatgaga	ccatggagat	caaaatcacc	aaggaccaca	840
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agtgggcatt	ggcagaactc	atcaacaatc	ctaaggtgtt	ggaaagggct	cgtgaggagg	960
tctacagtgt	tgtgggaaag	gacagacttg	tggacgaagt	tgacactcaa	aaccttcctt	1020
acattagagc	aatcgtgaag	gagacattcc	gcatgcaccc	gccactccca	gtgggtcaaaa	1080
gaaagtgcac	agaagagtgt	gagattaatg	gatatgtgat	cccagaggga	gcattgattc	1140
tcttcaatgt	atggcaagta	ggaagagacc	ccaaatactg	ggacagacca	tcggagttcc	1200
gtcctgagag	gttccctagag	acagaggctg	aaggggaagc	aaggcctctt	gatcttaggg	1260
gacaacattt	tcaacttctc	ccatttgggt	ctgggaggag	aatgtgccct	ggagtcatte	1320
tggctacttc	gggaatggca	acacttcttg	catctcttat	tcagtgtctt	gacttgcaag	1380
tgctgggtcc	acaaggacag	atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	1440
gagccggcct	cactgttcca	agggcacata	gtcttgtctg	tgttccactt	gcaaggatcg	1500
g						1501

<210> 55
 <211> 499

<212> PRT

<400> 55

His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
20 25 30

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
50 55 60

Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
85 90 95

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
115 120 125

Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp
145 150 155 160

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
180 185 190

His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
210 215 220

Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly
245 250 255

Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe
275 280 285

Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Arg Ala Arg Glu Glu Val
 305 310 315 320
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln
 325 330 335
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
 340 345 350
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Glu Ala Glu Gly Glu Ala Arg Pro Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Ile Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 56
 <211> 1501
 <212> DNA
 <213> Medicago sativa

<400> 56
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 acccaccaag cccaaagcct cgtcttcctt tcataggaca ctttcatctc ttaaaagaca 120
 aactttctcca ctacgcactc atcgacctct ccaaaaaaca tggtcctta ttctctctct 180
 actttggctc catgccaaacc gttgttgctt ccacaccaga attgttcaag ctcttccttc 240
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 cctatgatag ctcaagtggcc atggctccct tcggacctta ctggaagttc gtgaggaagc 360
 tcatcatgaa cgaccttctc aacgccacca ctgtaaaciaa gttgaggcct ttgaggacct 420
 aacagatccg caagttoctt aggggttatg cccaaggcgc agaggcacag aagccccttg 480
 acttgaccga ggagcttctg aaatggacca acagcaccac ctccatgatg atgctcggcg 540
 aggetgagga gatcagagac atcgcccgcg aggttcttaa gatctttggc gaatacagcc 600
 tcaactgact catccggcca ttgaagcatc tcaaggttg aaagtatgag aagaggatcg 660
 acgacatctt gaacaagtgc gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga 720
 tcgtgaggag gagaaagaac ggagagggtg ttgagggtga ggtcagcggg gttttccttg 780
 acactttgct tgaattcgct gaggatgaga ccacggagat caaaatcacc aaggaccaca 840
 tcaagggtct tgttgctcgac tttttctcgg caggaacaga ctccacagcg gtggcaacag 900
 agtgggcatt ggcagaactc atcaacaatc ctaaggtgtt ggaaaaggct cgtgaggagg 960

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gaaagtgcac	agaagagtgt	gagattaatg	gatatgtgat	cccagaggga	gcattgattc	1140
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tggtactctt	gggaatggca	acacttcttg	catctcttat	tcagtgcctt	gacttgcaag	1380
tgctgggtcc	acaaggacag	atattgaagg	gtgggtgacgc	caaagttagc	atggaagaga	1440
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 <211> 499
 <212> PRT
 <213> Medicago sativa

<400> 57
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 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
 35 40 45
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
 50 55 60
 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
 65 70 75 80
 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
 85 90 95
 Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Ala Pro Phe Gly Pro
 100 105 110
 Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
 115 120 125
 Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
 130 135 140
 Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp
 145 150 155 160
 Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Thr Ser Met Met
 165 170 175
 Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
 180 185 190
 Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Arg Pro Leu Lys
 195 200 205
 His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
 210 215 220
 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile
 225 230 235 240

Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly
245 250 255
Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu
260 265 270
Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe
275 280 285
Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
290 295 300
Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val
305 310 315 320
Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln
325 330 335
Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
340 345 350
Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
355 360 365
Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
370 375 380
Gln Val Gly Arg Asp Ser Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
385 390 395 400
Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu
405 410 415
Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
420 425 430
Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
435 440 445
Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
450 455 460
Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
465 470 475 480
Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
485 490 495
Ala Arg Ile

<210> 58
<211> 1501
<212> DNA
<213> Medicago sativa

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aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggccctta ttctctctct 180

actttggctc	catgccaacc	gttgttgcoct	ccacaccaga	attgttcaag	ctcttcctcc	240
aaacgcacga	ggcaacttcc	ttcaacacaa	ggttccaaac	ctcagccata	agacgcctca	300
cctatgatag	ctcagtggcc	atggttccct	tcggaacctta	ctggaagttc	gtgaggaagc	360
tcatcatgaa	cgaccttctc	aacgccacca	ctgtaaacaa	gttgaggcct	ttgaggacce	420
aacagatccg	caagcttcctt	agggttatgg	cccaaggcgc	agaggcacag	aagccccttg	480
acttgaccga	ggagcttctg	aaatggacca	acagcaccat	ctccatgatg	atgctcggcg	540
aggctgagga	gatcagagac	atcgctcgcg	aggttcttaa	gatctttggc	gaatacagcc	600
tacttgactt	catctggcca	ttgaagcatc	tcaaggttgg	aaagtatgag	aagaggatcg	660
acgacatctt	gaacaagttc	gaccctgtcg	ttgaaagagt	catcaagaag	cgccgtgaga	720
tcgtgaggag	gagaaagaac	ggagagggtta	ttgaggggtga	ggtcagcggg	gttttccttg	780
acactttgct	tgaattcgct	gaggatgaga	ccacggagat	caaaatcacc	aaggaccaca	840
tcaagggctc	tgttgctcgac	tttttctcgg	caggaacaga	ctccacagcg	gtggcaacag	900
agtgggcatt	ggcagaactc	atcaacaatc	ctaagggtgtt	ggagaagggt	cgtgaggagg	960
tctacagtgt	tgtgggaaag	gacagacttg	tggacgaagt	tgacactcaa	aaccttcctt	1020
acattagagc	aatcgtgaag	gagacattcc	gcattgcaccc	gccactccca	gtgggtcaaaa	1080
gaaagtgcac	agaagagtgt	gagattaatg	gatattgtgat	cccagaggga	gcattgattc	1140
tcttcaatgt	atggcaagta	ggaagagacc	ccaaatactg	ggacagacca	tcggagttcc	1200
gtcctgagag	gttcctagag	acaggggctg	aaggggaagc	aaggcctctt	gatcttaggg	1260
gacaacattt	tcaacttctc	ccatttgggg	ctggggaggag	aatgtgccct	ggagtcaatc	1320
tggctacttc	gggaatggca	acacttcttg	catctcttat	tcagtgtctt	gacttgcaag	1380
tgctgggtcc	acaaggacag	atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	1440
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g						1501

<210> 59
 <211> 499
 <212> PRT
 <213> Medicago sativa

<400> 59
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 His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
 20 25 30
 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
 35 40 45
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
 50 55 60
 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
 65 70 75 80
 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
 85 90 95
 Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
 100 105 110
 Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
 115 120 125
 Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
 130 135 140
 Leu Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp
 145 150 155 160
 Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met

165										170					175				
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu				
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Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys				
		195					200					205							
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn				
	210					215					220								
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile				
225					230					235					240				
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Ile	Glu	Gly	Glu	Val	Ser	Gly				
				245					250					255					
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu				
			260					265					270						
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe				
	275						280					285							
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala				
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Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val				
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Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln				
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Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His				
		340						345					350						
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile				
		355					360					365							
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp				
	370					375					380								
Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg				
385					390					395					400				
Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu				
			405					410						415					
Asp	Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg				
			420					425					430						
Arg	Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu				
		435					440					445							
Leu	Ala	Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln				
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Gly	Gln	Ile	Leu	Lys	Gly	Gly	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg				
465					470					475					480				
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Ala Arg Ile

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 <211> 1497
 <212> DNA
 <213> Beta vulgaris

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 tctccactac gcactcatcg acctctccaa aaaacatggg cccttattct ctcactactt 180
 tggctccatg ccaaccggtg ttgcctccac accagaattg ttcaagctct tcctccaaac 240
 gaacgaggca acttccttca acacaagggt ccaaacctca gccataagac gcctcaccta 300
 tgatagctca gtggccatgg ttcccttcgg accttactgg aagttcgtga ggaagctcat 360
 catgaacgac cttctcaacg ccaccactgt aaacaagttg aggcctttga ggacccaaca 420
 gatccgcaag ttctttaggg ctatggccca aggcgcagag gcacggaagc cccttgactt 480
 gaccgaggag cttctgaaat gggccaacag caccatctcc atgatgatgc tcggcgaggc 540
 tgaggagatc agagacatcg ctgcgcagggt tcttaagatc tttggcgaat acagcctcac 600
 tgacttcac c tggccattga agcatctcaa ggttggaag tatgagaaga ggatcgacga 660
 catcttgaac aagttcgcac ctgtcgttga aagagtcac aagaagcgcc gtgagatcgt 720
 gaggaggaga aagaacggag aggttggtga ggtgaggtc agcggggttt tccttgacac 780
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 cagtgttgtg ggaaaggaca gacttggtga cgaagttgac actcaaaacc ttccttacat 1020
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 gtgcacagaa gagtgtgaga ttaatggata tgtgatccca gagggagcat tgattccctt 1140
 caatgtatgg caagtaggaa gagaccccaa atactgggac agaccatcgg agttccgtcc 1200
 tgagaggttc ctagagacag gggctgaagg ggaagcaagg cctcttgatc ttaggggaca 1260
 acattttcaa cttctcccat ttgggtctgg gaggagaatg tgccctggag tcaatctggc 1320
 tacttcggga acggcaacac ttcttgcatc tcttattcag tgctttgact tgcaagtgtc 1380
 gggctccacag ggacagatat tgaagggtgg tgacgcaaaa gttagcatgg aagagagagc 1440
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 <211> 498
 <212> PRT
 <213> Beta vulgaris

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 Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His
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 Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu
 35 40 45
 Ser Lys Lys His Gly Pro Leu Phe Ser His Tyr Phe Gly Ser Met Pro
 50 55 60
 Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr
 65 70 75 80
 Asn Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg
 85 90 95
 Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr

100					105					110					
Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr
		115					120					125			
Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe
	130					135					140				
Leu	Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Arg	Lys	Pro	Leu	Asp	Leu
145						150					155				160
Thr	Glu	Glu	Leu	Leu	Lys	Trp	Ala	Asn	Ser	Thr	Ile	Ser	Met	Met	Met
			165						170					175	
Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys
			180					185					190		
Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His
		195					200					205			
Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys
	210					215					220				
Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val
225						230					235				240
Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val
				245					250					255	
Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile
			260					265					270		
Lys	Ile	Thr	Lys	Asp	His	Thr	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser
		275					280					285			
Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu
	290					295					300				
Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	Tyr
305						310					315				320
Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn
				325					330					335	
Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro
			340					345					350		
Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn
		355					360					365			
Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Pro	Phe	Asn	Val	Trp	Gln
	370					375						380			
Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	Pro
385						390					395				400
Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp
				405					410					415	
Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg
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Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Thr Ala Thr Leu Leu
435 440 445

Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly
450 455 460

Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala
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Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala
485 490 495

Arg Ile

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<213> Artificial Sequence

<220>
<223> PCR primer

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<210> 63
<211> 24
<212> DNA
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<220>
<223> PCR primer

<400> 63
ttaaacgtaa aatgaaacaa gagg 24

<210> 64
<211> 26
<212> DNA
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<400> 64
gacacttcga cactgctgct gcttat 26

<210> 65
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<210> 66

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 <222> (96)..(96)
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<223> Xaa=Ile, Val, or Thr

<220>
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<223> Xaa=Arg or His

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<223> Xaa=Ser or Leu

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<223> Xaa=Met or Arg

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<223> Xaa=Ala or Val

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<223> Xaa=Lys or Glu

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His	Leu	Arg	Pro	Thr	Pro	Xaa	Ala	Xaa	Ser	Lys	Ala	Leu	Arg	His	Leu
			20					25					30		
Pro	Asn	Pro	Pro	Ser	Pro	Xaa	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Xaa
		35					40					45			
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Xaa	Ile	Asp	Leu	Ser
	50					55				60					
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Xaa	Xaa	Phe	Gly	Ser	Met	Pro	Thr
65					70				75					80	
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Xaa	Xaa
				85					90					95	

Glu Ala Thr Ser Phe Xaa Thr Arg Phe Gln Thr Ser Ala Xaa Arg Xaa
 100 105 110
 Leu Thr Tyr Asp Xaa Xaa Val Ala Xaa Xaa Pro Xaa Gly Pro Tyr Trp
 115 120 125
 Xaa Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
 130 135 140
 Val Asn Xaa Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Xaa Leu
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 Arg Xaa Met Ala Gln Xaa Ala Glu Ala Xaa Lys Pro Leu Asp Xaa Thr
 165 170 175
 Glu Glu Leu Leu Lys Trp Xaa Asn Ser Thr Xaa Ser Met Met Xaa Leu
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 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
 195 200 205
 Xaa Gly Glu Tyr Ser Leu Thr Asp Phe Ile Xaa Pro Leu Lys Xaa Leu
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 Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
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 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Xaa Ile Val Arg
 245 250 255
 Arg Arg Xaa Asn Gly Glu Xaa Xaa Glu Gly Glu Xaa Ser Gly Val Xaa
 260 265 270
 Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Xaa Glu Ile Lys
 275 280 285
 Ile Thr Lys Xaa Xaa Xaa Lys Gly Leu Val Val Asp Xaa Phe Ser Ala
 290 295 300
 Gly Xaa Asp Ser Thr Ala Xaa Xaa Thr Glu Trp Ala Leu Ala Glu Leu
 305 310 315 320
 Ile Asn Asn Pro Xaa Val Leu Xaa Xaa Ala Arg Glu Glu Xaa Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Xaa Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Xaa Glu Glu Cys Xaa Ile Asn Gly
 370 375 380
 Xaa Val Xaa Pro Glu Gly Ala Leu Xaa Xaa Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Xaa Asp Xaa Lys Tyr Trp Asp Arg Pro Ser Glu Xaa Arg Pro Glu
 405 410 415

Arg	Phe	Leu	Glu	Thr	Xaa	Ala	Glu	Gly	Glu	Ala	Xaa	Xaa	Leu	Asp	Leu	
		420						425					430			
Arg	Gly	Xaa	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Xaa	Met	
		435					440					445				
Cys	Pro	Gly	Val	Xaa	Leu	Ala	Thr	Ser	Gly	Xaa	Ala	Thr	Leu	Leu	Ala	
		450				455					460					
Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly	Gln	
465					470					475					480	
Ile	Leu	Lys	Gly	Xaa	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	Ala	Gly	
			485						490					495		
Leu	Thr	Val	Pro	Arg	Ala	His	Ser	Leu	Val	Cys	Val	Pro	Leu	Ala	Arg	
		500						505					510			
Ile	Gly	Val	Ala	Ser	Lys	Leu	Leu	Ser								
		515					520									